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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,756	01/09/2006	Hirobumi Tanaka	126578	3416
25944	7590	01/30/2008		
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ALEXANDRIA, VA 22320-4850				
			EXAMINER	
			NGUYEN, KHANH TUAN	
			ART UNIT	PAPER NUMBER
			1796	
			MAIL DATE	DELIVERY MODE
			01/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,756	Applicant(s) TANAKA ET AL.	
	Examiner Khanh T. Nguyen	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The preliminary amendment filed on 01/09/2006 is entered and acknowledged by the Examiner. Claims 1-15 are currently pending in the instant application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicant benefits the Foreign Priority filed on 07/18/2003.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 01/09/2006 and 08/03/2006 has been initialed by Examiner.

Drawings

4. No drawing was submitted.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 5, 7, 9, 11, and 13-15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 15, 16, 18-20, 23, 32, and 35 of copending Application No. 10/558,292. Although the conflicting claims are not identical, they are not patentably distinct from each other because both inventions are directed toward a resistor paste containing lead-free glass material, -lead-free conductive material, organic vehicle, and perovskite (e.g. CaTiO_3) with NiO and CuO in overlapping concentrations.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-15 are rejected under 35 U.S.C. 102(a) as being anticipated by English Translation of Tanaka et al. (JP Pub. 2003-197405, hereinafter, "Tanaka").

Tanaka teaches a resistor paste and electronic component made therefrom which contains a lead-free glass material, lead-free electrically conductive material, organic vehicles and NiO as an additive wherein the glass content is 60-80%, electrically conductive material is 8 to 32%, and the NiO is between 0 and 12 volume % (Abstract). One embodiment of the invention contains additionally CaTiO₃ and CuO as additives at 0 to 13 volume % and 0 to 8 volume % respectively [0015]. The glass ingredient contains CaO, SrO, BaO, B₂O₃, SiO₂ and ZrO₂ [0021-0024]. The conductive ingredient is preferably RuO₂ [0025] but can also be Bi₂Ru₂O₇, CaRuO₃, SrRuO₃, and BaRuO₃ [0034]. Other conductive ingredients mentioned include Ag, Pd and Ag-Pd alloys [0034].

The reference specifically or inherently meets each of the claimed limitations in their broadest interpretation. The reference is anticipatory.

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8. Claims 1, 3-8, and 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Scheiber (U.S. Pat. 4,251,397 hereinafter, "Scheiber").

Scheiber teaches a resistor composition comprising of a nonreducible glass containing (in mole %) 10-30% of CaO, SrO, or BaO, 35-55% SiO₂, 20-35% B₂O₃, 5-15% Al₂O₃, 0-4 ZrO₂, 0-1% TiO₂, and 0-2% Li₂O (Col. 7, lines 17-22); 15-50 parts by weight of conductive material (Col. 5, lines 21-29 and Col. 6, lines 3-10); and EVA polymer as an organic vehicle (Col. 5, lines 16-20). Scheiber further teaches the weight ratio of conductive material (hexaboride) to glass is from 10:90 to 95:5 while the weight ratio of slids to organic vehicle is from 1:2 to 20:1 (Col. 3, lines 31-33). Alternatively, a perovskite type crystal structure oxide such as CaZrO₃ and CaTiO₃ can be used as the precursors of ZrO₂ and TiO₂ (Col. 7, lines 39-42). (Please see examples 1-3). Scheiber also teaches the non-noble metals such as copper and nickel may be used as conductor components and form copper oxide and nickel oxide during firing in an oxidizing atmosphere (Col. 2, lines 1-13).

The reference specifically or inherently meets each of the claimed limitations in their broadest interpretation. The reference is anticipatory.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over (U.S. Pat. 6,399,230 hereinafter, "Tormey") in view of Hormadaly (EP Pub. 0,132,810 hereinafter, "Hormadaly").

Tormey teaches a thick film resistor ink (paste) composition comprising of 75.87 to 79.21 wt % of glass 1, 19.8 to 23.14 wt % RuO_2 (conductor material), organic vehicle, and 0.99 to 1.1 wt % BaTiO_3 (a perovskite type crystal structure) as a TCR modifier (Col. 3, lines 36-46 and Table VI). The weight percent of Tormey components is considered readable on the volume percent of the instant claimed invention because such a mathematical conversion is known to a skilled artisan. Tormey further teaches the said glass 1 containing 5 wt % CaO , 39 wt. % B_2O_3 , and 6 wt. Al_2O_3 (Table II). The reference teaches a small amount of BaTiO_3 (perovskite type crystal structure oxide) can be added to a resistor paste to adjust thermal coefficient of resistance (TCR) values (Col. 2, lines 15-35). Tormey teaches a resistor comprising of the said resistor ink composition (Col. 7, lines 3-7). It is generally known in the art that a conductive ink formulation such as the resistor paste of Tormey may be used in an electric device such as multilayer circuit boards (Col. 1, lines 13-28).

The difference between the instant invention and Tormey reference is that Tormey failed to suggest a glass material including NiO and CuO within the claimed amount.

In an analogous art, Hormadaly teaches a glass composition comprising of 0-15 mol% NiO and 0-5 mol % CuO (Page 3, lines 5-10). Hormadaly further teaches

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transition metal oxide such as NiO and give various colors and provide a range of resistors all having desirably positive HTCR values (Page 26, lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the resistor paste of Tormey by incorporating CuO and NiO within the claimed amount taught by Hormadaly, in order to produce a resistor paste having a desirable esthetic color and a positive HTCR values.

11. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano et al (U.S. Pat. 6,428,914) in view of Hormadaly (EP Pub. 0,132,810 hereinafter, "Hormadaly").

Nagano teaches a composite substrate which can provide a thin film EL substrate. One component is a paste for creating an electrode material. The paste contains an organic binder along with a plasticizer, dispersing agent, and an insulator material (Col. 6, lines 6-21). The electrode material contains metals such as Ag, Pd, or Ag-Pd (Col. 6, lines 24-33). The electrode layer also can contain a glass frit to enhance adhesion to a substrate. This can include borosilicate glass which contains 5 to 50 weight percent B₂O₃ and 5 to 70 weight percent of SiO₂. The glass frit can contain "at least one additive" of CaO (0.01 to 50 weight percent), SrO (0.01 to 70 weight percent), and BaO (0.01 to 50 weight percent). (Col. 6, lines 46-65). The insulator material can include composite titanium oxides, titanium-based composite oxides and mixtures of these present up to 1 weight percent. Examples of composite titanium oxides include

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TiO₂ that contains CaO. An example of the titanium- based composite oxides include CaTiO₃ (Col. 7, lines 21-27).

The difference between the instant invention and Nagano reference is that Nagano failed to suggest a glass material including NiO and CuO within the claimed amount.

In an analogous art, Hormadaly teaches a glass composition comprising of 0-15 mol% NiO and 0-5 mol % CuO (Page 3, lines 5-10}. Hormadaly further teaches transition metal oxide such as NiO and give various colors and provide a range of resistors all having desirably positive HTCR values (Page 26, lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the resistor paste of Nagano by incorporating CuO and NiO within the claimed amount taught by Hormadaly, in order to produce a resistor paste having a desirable esthetic color and a positive HTCR values.

12. Claims 2, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Scheiber (U.S Pat. 4,251,397) as applied to the above claims, and further in view of Hormadaly (EP Pub. 0,132,810).

Scheiber is relied upon as set forth above. With respect to instant claims 2, 9, and 10, Scheiber failed to suggest the resistor paste composition further comprising of 0.1-10 mol % of NiO and 0.1-2 vol % of CuO (0.1-6 wt.%).

In an analogous art, Hormadaly teaches the addition of transition metal such as nickel oxide can be used to color the glass and help produce resistor having a low TCR

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(Page 8, lines 20-28). Hormadaly further teaches adding CuO and NiO to resistor composition to obtain a desirable positive HTCR value (Page 26, lines 5-10).

Hormadaly also teaches the resistor paste composition containing 0-15 mol % NiO and 0-5 mol % CuO (Page 3, lines 5-10). The disclosure of 0-5 mol% of CuO is considered readable on the claimed vol % and wt % of CuO because it is within the expected skilled of an artisan to convert mol % to vol % and wt % of CuO.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the resistor paste of Scheiber by incorporating CuO and NiO as taught by Hormadaly, in order to produce resistor having a low TCR value and a desirable positive HTCR value.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh T. Nguyen whose telephone number is (571) 272-8082. The examiner can normally be reached on Monday-Friday 8:00-5:00 EST PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KTN
01/03/2008



Mark Kopec
Primary Examiner